

Access Intermediate

Academic Computing Services

A Division of Information Services

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Abstract: This document introduces users how to design a *query*, use queries to display related information from two or more tables, and construct selection criteria to extract specific records from tables using queries. It also instructs users how to create and utilize pivot tables and charts based on query information.

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Introduction

Microsoft Access XP is a relational database management system. This type of database allows a user to store, retrieve, manage and analyze data quickly and effectively. This workshop introduces queries and pivot tables and charts to participants. Here, they will learn about how to design and execute basic and intermediate types of queries. They will also learn how to create and utilize pivot tables and charts based on queries.

Objectives

The goal of this workshop is to introduce participants to queries and table relationships in *Microsoft Access*. After today's workshop, participants will be able to:

- Create and run a select query to display data from one or more related tables
- Sort data in a query
- Add criteria to a query to display specific records
- Create pivot tables and charts based on query data

Prerequisites

Access: Introduction or equivalent skills

Related Training Available from ACS

All workshops offered by Academic Computing Services (ACS), a division of Information Services, are free to KU students, staff, faculty, and [approved affiliates](#). The general public is also welcome to most workshops, but some ACS workshops require a [registration fee](#) for them.

To learn more about or register for workshops, receive automatic announcements of upcoming workshops, and track workshops you've registered for and have attended, visit the ACS Web site at www.ku.edu/acs/train. You can also check our online schedule at www.ku.edu/acs/schedule for a list of class offerings and their availability. For further workshop related questions, please email training@ku.edu.

ACCESS: FORMS

This three-hour, hands-on workshop introduces creating forms via AutoForm and the Form Wizard. Students will also create and modify a form in design view while utilizing the **Toolbox toolbar** and learn how to insert subforms.

Running and Creating Select Queries

Queries are objects in our database used to select field and record information from one or more tables, or even from other queries. A **query** creates a new *dataset* based on the data in the objects (i.e., tables and queries) from which it is built. A dataset is a selection of fields and record data displayed in a *datasheet*, like a table.

Select queries are the most basic type of query. They are called **select queries** because all we do is select the fields that we want displayed in the dataset when the query is run.

Running a Query

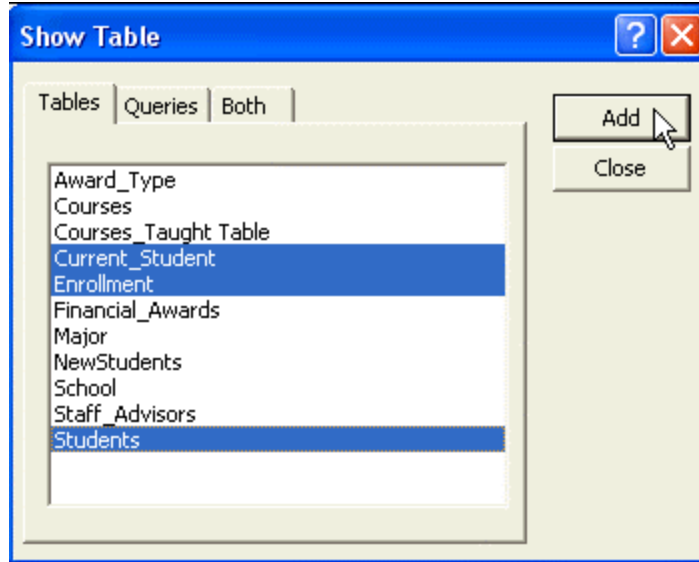
When we want to see the information in a **query**, we perform an action known as *running a query*. One way to run a **query** is to double click on the name of the query in the database window. The **query** will open up into datasheet view and display the data from the fields that were chosen to create the query. There are other ways to run queries that will be taught in the next section.

Creating a Query

Design View

One of the most popular ways to create a query is in design view. This view offers many different options that include not only choosing the table or tables and fields for your query, but also sorting and adding additional criteria. To create a query in design view, you can do the following:

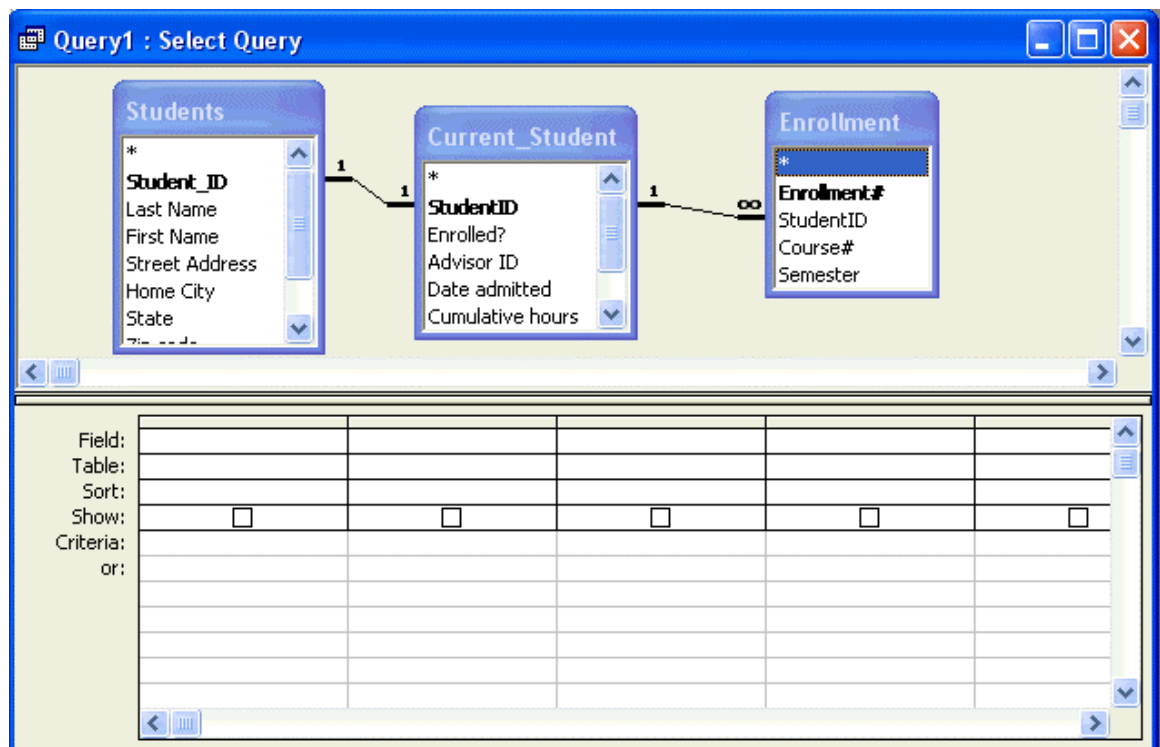
1. Click on the **Query** button on the **Objects** bar in the database window.
2. Double click **Create Query in Design View**.
3. When the query opens in design view, the **Show Table** dialog box will appear.



4. Select the table or tables by clicking on each table name and clicking the **Add** button.

Note: You can also use the **Ctrl** key to select non-adjacent table names or the **Shift** key to select adjacent table names. Once you've selected all of your tables, click on the **Add** button.

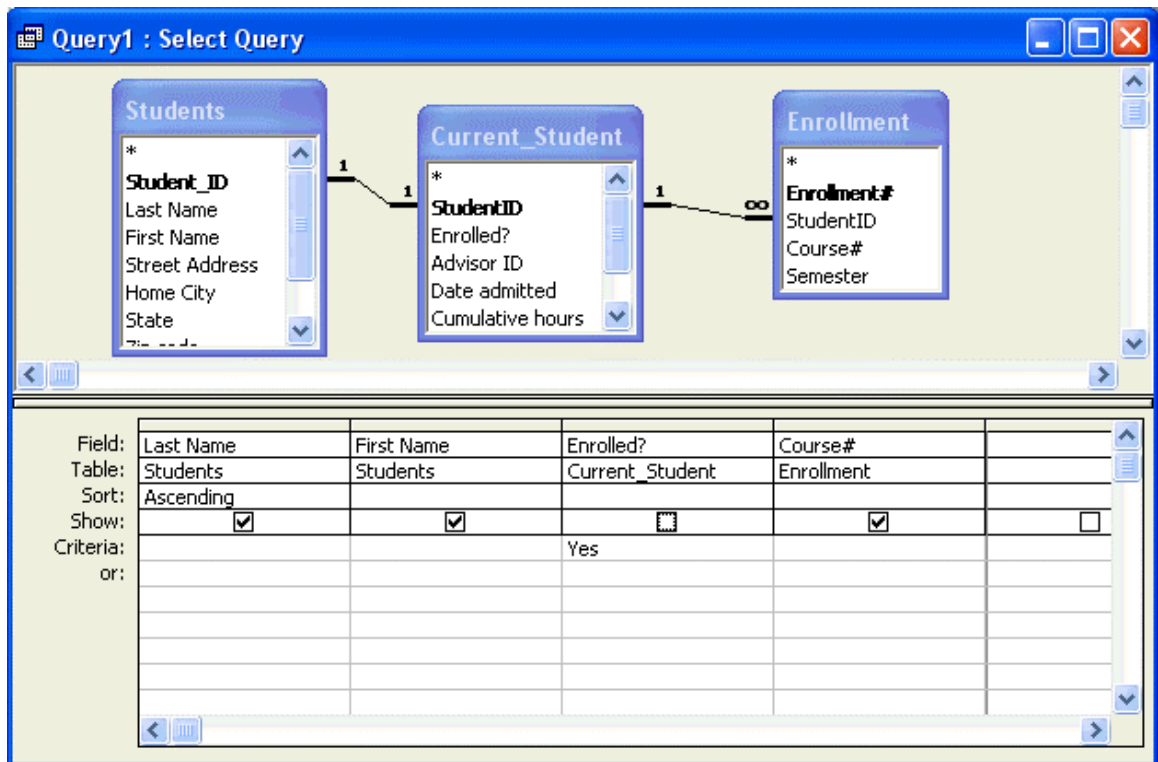
5. Once you are finished adding tables to your query window, click on the **Close** button.



6. Rearrange your field lists in the upper window as needed.

Note: You can resize your field lists in the upper part of the query's design window by placing your mouse on the edge of the list and clicking and dragging the list with a double headed arrow to adjust the width and height. You can also make the upper window larger by placing the mouse along the horizontal line that separates the upper and lower windows and clicking and dragging with the double headed arrow.




7. To add fields to your **Query By Example** (QBE) grid, you have several options:
 - a) You can double click on each field name and they will automatically add to the **Field** cell with the table name they came from in the **Table** cell.
 - b) You can select adjacent fields using **Shift** or non-adjacent fields using **Ctrl** by clicking on each field name as you hold down the key you need. Once you've finished choosing the fields, click and hold the click down on the last field name you chose as you drag it down to the grid. When placed in the grid, it will look like three little steps. Let go of the click for the fields to automatically add themselves to the grid.




8. Once your fields are added, you can change your **sort** order to ascending or descending in the **Sort** field. Access always sorts left to right when more than one field is used to sort. You can sort non-adjacent fields.

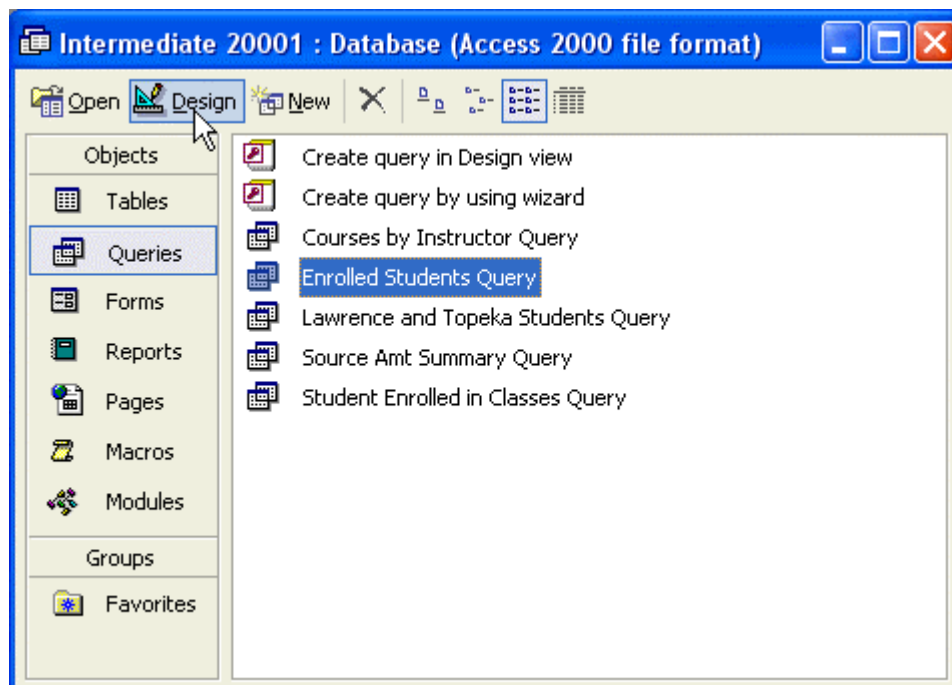
9. You can also add any criteria to the **Criteria** and **Or** fields. (For more about criteria, see

Adding Criteria to Select Queries.)

10. If you include a field in the query for sorting or selection purposes that you don't want displayed when you run the query, you can click the ✓ in the **Show** box to deselect the field. When deselected, the field remains in the query, but will not be visible when the query displays its results in datasheet view.
11. After you're finished designing your query, you can click on the **Run** button  or **Datasheet** button . In a select query, both buttons do the same thing.
12. To save your query, click on the **Save** button  or **File→Save**. When the **Save Query** dialog box opens with the default name of Query1 selected, type over the default name with a new one and click **OK**.

Editing Select Queries

Once you've created your query, you can go back and make modifications to it at any time. If the query is open, you can click on the **Design View** button  to change the query back to design view and make your changes. Here are some of the changes you might decide to make to your query. If the query is closed, you can select the query you want to edit by clicking on the name one time and then clicking on the **Design View** button under the **Database** toolbar in the database window.



Adding Fields

To add a field to your query, you can double click on the field name or you can click and drag the field down the column you want to add it to. When you add a field to a column that already contains a field, all of the fields will pick up and move over to the right to make room for the new field.


Rearranging Fields

To move a field that is already in the QBE grid, you can select the column with the mouse by placing the mouse above the field name and when it changes to a black down arrow, click one time. When the field has been selected, let go of the click, and when the mouse changes back to a regular pointer display, click on the gray bar directly above the column and drag the field to its new location. A black vertical line will let you know where you will drop the field.

Deleting Fields

To delete a field from the grid, select the field by clicking with the black drop down arrow on the small gray bar directly above the column where the name is contained. When the column is selected, press the **Delete** key on your keyboard.

Adding and Removing Tables

You can add more tables to your query design by clicking the Show Table  button on the **Standard** toolbar. You also have the option to always remove tables from the query as well. To remove tables from the query simply click on any field in the field list and press **Delete** on your keyboard.

Note: If you remove a table from your query without removing the fields, they will be automatically deleted from the grid when the table is deleted.

After you've changed the query, you can either click on the **Save** button or **File→Save** to save over the original or click on **File→Save As...** to save the query under a new name in order to preserve the original. Once you've saved your query, you might run it again to ensure that it is correct.

Adding Criteria to Select Queries

The cells in the **Criteria** row create the “rules” or criteria to filter the records. By entering an *expression* in this cell, you can limit the number of records included in your query.

The **Or** field is a supplement to the **Criteria** field that allows you to modify the filtering even further.

If you want to include only certain records in your query, you can enter an expression that filters out unwanted records from your table. You can build these expressions with the following comparison criteria operators:

Operator	Meaning
=	Matches exact occurrences (this is the default comparison criteria operator).
>	Matches records that are greater than the criteria value.
>=	Matches records that are greater than or equal to the criteria value.
<	Matches records that are less than the criteria value.
<=	Matches records that are less than or equal to the criteria value.
<>	This is the not equal to symbol. It excludes records with the criteria value.
And	Allows you to combine the comparison operators to retrieve only records where all of the criteria are met.
Or	Allows you to combine the comparison operators to retrieve records where only one of the criteria must be met.
Not	Excludes records or can be used to retrieve the opposite of the criteria that follows.
Between...And	Use these two booleans together to return a range of records, such as a date range.

Operator	Meaning
Like	Matches a pattern in a field using the wildcards below.
*	A placeholder for any amount of characters. Can be used at the beginning or end of the criteria
?	A placeholder for a single character.
&	Used to concatenate or join two or more fields together and can also join other characters with those fields.

Note: Access will automatically include quotation marks around text and pound signs around dates. You will need to type quotations around criteria that uses the **Not** operator in a number datatype field.

Creating Calculated Fields

Queries can do more than show data from multiple tables. With queries, you can also create calculations based on the data that you have. There are many ways to create calculations in queries. One way is to use the built-in functions that Access already has, such as the DateDiff function, which calculates the difference between date values, or the Immediate If (IIF) function, which provides one result if the logical test run is true and a different result if the logical test run is false.

Other ways to create calculated fields can also include using operators, such as + for addition, * for multiplication, and & for concatenating. The following are examples of calculated fields.

```
StudentName=[Last Name]&" , "&[First Name]
```

```
Total=[Quantity]*[Price]
```



Using Pivot Tables and Pivot Charts (*New in Access XP!*)

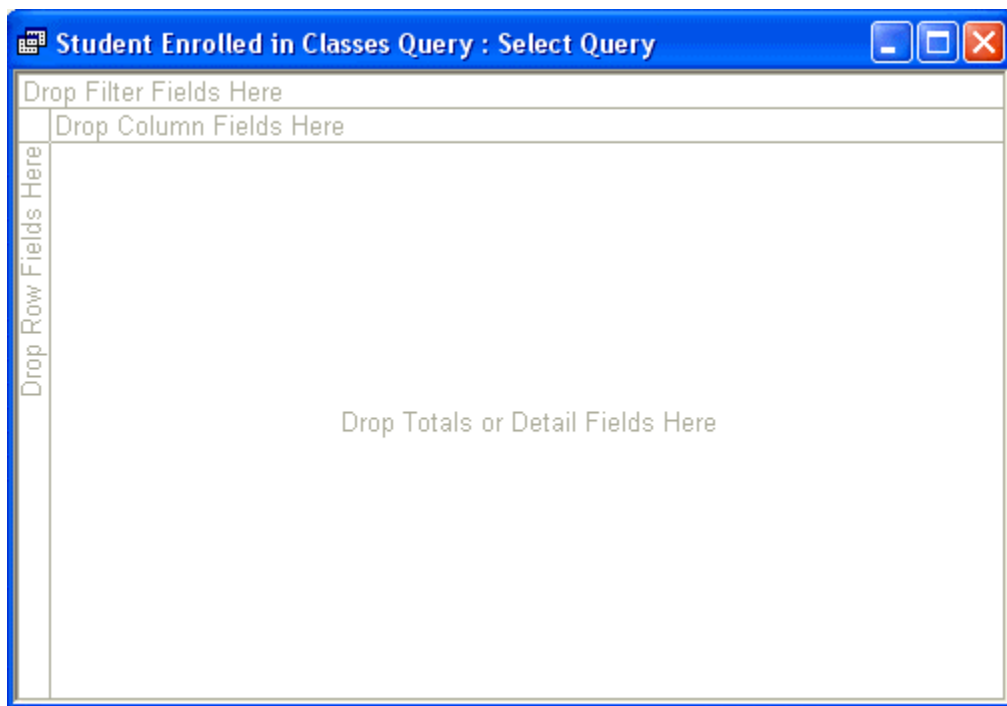
In Access XP you can now create pivot tables and pivot charts like the ones in Microsoft Excel. Access allows users to utilize Microsoft PivotTable and Microsoft PivotChart to analyze data without having to leave Access. By default, the pivot table view will show data details of the fields that you decide to use, but you can show, hide, and summarize your details in a number of ways, including charting it. Pivot tables use rows, columns, and detail areas, but there are other areas that can be used as well.


In turn, the pivot chart view can then summarize your pivot table to provide a graphical representation and analysis of your data. Unlike the pivot table, the pivot chart uses series, categories, and data areas. Some of the chart types that can be created are column, bar, area, pie, and XY scatter along with several others.

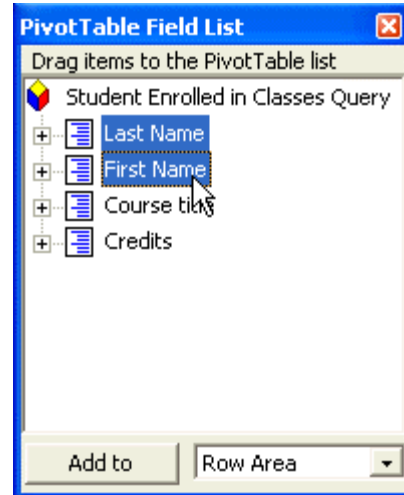
Creating Pivot Tables

To create a pivot table, do the following:

1. Double click on the table or query whose data you want use to create a pivot table.
2. Click on the drop down arrow of the Design View  button and select the **Pivot Table View**  button.



- Once you are in Pivot Table View, select which field(s) you want to use as the **Row Fields**. Use the **Field List** to select fields.
- Once the fields are selected, click and drag them into the **Drop Row Fields Here** section of the Pivot Table. As you drag the fields over to the section, their appearance will change to .
- Next, select the field(s) you want to use as **Column Fields**. Once the fields are selected, click and drag them into the **Drop Column Fields Here** section.
- Finally, select the field you want to use as the Detail or Total Field. Click and drag them to the **Drop Total or Detail Fields Here** section.



	StudentName					Grand Total
	Benson, Justin	Clark, Fred	Cooke, Joyce	McCall, Beth	Myrick, Bill	Grand Total
Course title	Credits	Credits	Credits	Credits	Credits	No Totals
Ancient Philosophy		3	3			
Basic Math					3	
College Physics				5		
Early Christianity	3		3	3		
Introduction to Astronomy			4	4		
Introduction to English			3			
Introduction to Physics	4					
Nature vs nurture					3	
Women in Society					3	
Grand Total						

- Click on Save to save your changes to your table or query.

Editing Pivot Tables

Once you have created your pivot table, there are several ways that it can be changed. One way to change the pivot table is by actually changing the information inside of the table, or changing the data. To change the data of the pivot table or to add new data to the pivot table, you change the data in the table or query the pivot table is linked to. For example, if a new student were added to the database along with classes they were enrolled in and the number of credit hours, the pivot table data would refresh when the Student Enrolled in Classes Query was run again and the pivot table view displayed. Notice the difference between the screen shot above and the screen shot below:

ACS Computer Training
Access Intermediate


Course title	Alexander, Jane	Benson, Justin	Clark, Fred	Cooke, Joyce	McCall, Beth	Myrick, Bill	Grand Total
Ancient Philosophy			3	3			
Basic Math						3	
Calculus I	5						
College Physics					5		
Early Christianity		3		3	3		
Introduction to Accounting	3						
Introduction to Astronomy				4	4		
Introduction to English				3			
Introduction to Physics	4	4					
Nature vs nurture						3	
Women in Society						3	
Grand Total							

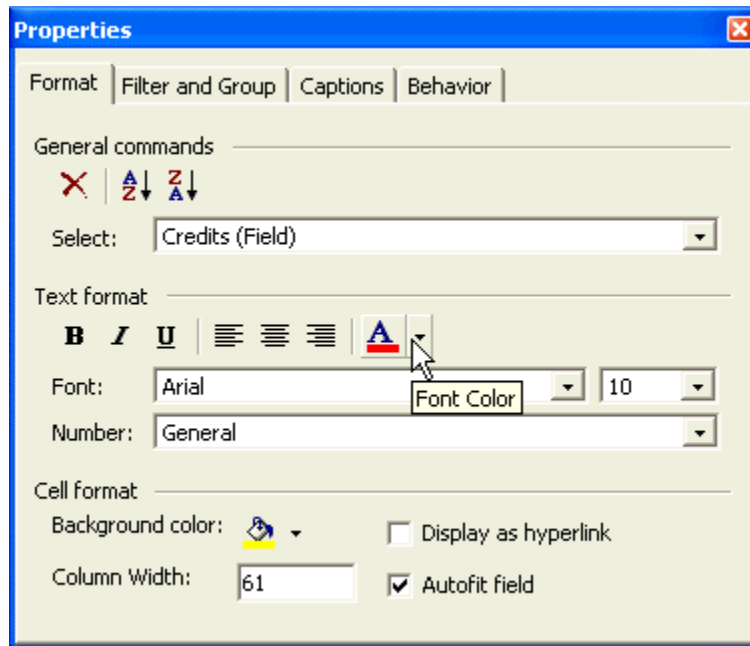
When Jane Alexander, a new student enrolled in classes, was added to the tables that were included in the Student Enrolled in Classes Query and that query was ran, Jane's information showed in the pivot table. Notice the classes Jane enrolled in also now show (Calculus 1 and Introduction to Accounting).

Another way to edit a pivot table is to change the layout of the table. The above layout shows Course Title as the Row Field and StudentName as the Column Field. Here is what the table would look like if the fields were switched:



StudentName	Ancient Philosophy	Basic Math	Calculus I	College Physics	Early Christianity	Introduction to Accounting	Introduction to Astronomy
Alexander, Jane			5			3	
Benson, Justin					3		
Clark, Fred	3						
Cooke, Joyce	3				3		4
McCall, Beth				5	3		4
Myrick, Bill			3				
Grand Total							

As you can see, it becomes more difficult to see all of the information because the Course Title names are long. Therefore, the previous layout might work better if you were going to print your pivot table.

Another way of changing your pivot table is through the **Properties**  button. When you select a field heading in the pivot table and click on the properties button, the properties dialog box for that field will display. There are many different field attributes that can be changed through this dialog box including font and background colors and captions.





Calculating Fields

Within pivot tables, you can summarize data by creating new calculations or by calculating data based on fields you already have. For example, if you wanted to know the total number of credit hours was for each student, you could use the **AutoCalc**  button to create a Sum calculation for each student that would total their number of credit hours. You could then use the properties dialog box for the new field, **Sum of Credits**, and change the caption to **Total Credits**. You could also choose to hide the detail information using the **Hide Details**  button. The following would be the end result:

Course title	Alexander, Jane	Benson, Justin	Clark, Fred	Cooke, Joyce	McCall, Beth	Mynrick, Bill	Grand Total
Ancient Philosophy	3			3			6
Basic Math	3						3
Calculus I		5					5
College Physics			5				5
Early Christianity			3	3			6
Introduction to Accounting		3					3
Introduction to Astronomy				4			4
Introduction to English				3			3
Introduction to Physics		4	4				8
Nature vs nurture						3	3
Women in Society						3	3
Grand Total	12	7	3	13	12	9	56

Creating PivotCharts

You can also create PivotCharts in Access. To create a pivot chart, open or run your table or query and select the **Pivot Chart View**  button. When you are in pivot chart view, you use the Chart Pivot Field list to drag and drop your fields where you want them to be, just like you do in a pivot table. In our example, we use the **Source Amt Summary Query**. Use the **SumofAmount** field as the **Data** field and the **Source** field as the **Category** field. By default, a **Column** chart type will be created, but you can change the chart type using the **Chart Type**  button.

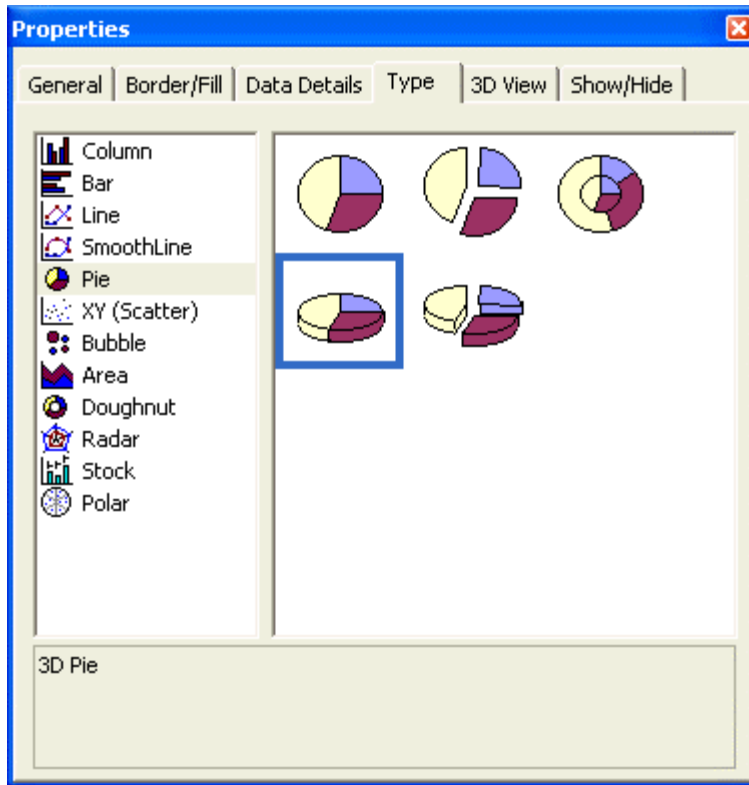
Formatting the Chart



You can also format other parts of the chart as well. Everything in the chart is a chart object and can be formatted by using the properties button once selected. Inside of the properties dialog box, you can change things, such as colors of text and background, captions, number formats, and many other options. Here are a few other things you can do using the properties dialog box of specific chart objects.

Changing the Chart Type

To change the chart type of a pivot chart, do the following:


1. Select either the **Plot area** or the **Chart Space**.
2. Click the Chart type button and select the type of chart you want in the **Properties** dialog box on the **Type** tab.

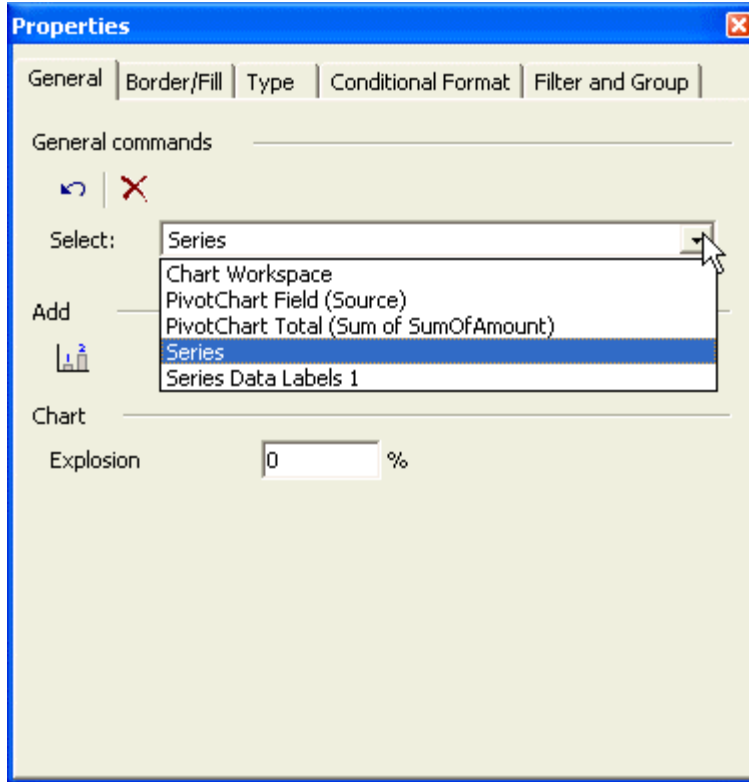



3. Close the properties dialog box.
4. Click on the **ByRow/ByColumn**  button to change the chart area as needed.
5. Click the **Show Legend**  button to show the legend.

Adding Data Labels

Charts series can also have data labels. Data Labels can help explain the graphical pieces of the chart by providing the data from the dataset as labels attached to the bars, columns, or pie pieces of a chart. This can aid in deciphering what each data series represents numerically. To add data labels, do the following:

1. Click on any data series and then click on the **Properties**  button.
2. In the properties dialog box, click on the **General** tab and click on the drop-down arrow of the select field. Choose **Series** from the list to select every data series that you have. Otherwise, only one label will be added to one category.



3. Under **Add**, click on the **Add Data Label**  button.
4. Close the properties dialog box. You should now have data labels in your chart.

Once you've added data labels, you can format them by clicking once on a label and then clicking once on the label again. From there, you can select the properties button, which will take you to the properties dialog box for the labels, and format your labels accordingly by changing things, such as the number format or type of value that is showing.

Getting Additional Help

ACS provides consulting and Q&A help in a variety of ways:

785/864-0200
question@ku.edu
www.ku.edu/acs/help

To evaluate this course online, please visit www.ku.edu/acs/training/evaluation

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